

REMARKS

Applicants respectfully traverse and request reconsideration.

Allowable Subject Matter

The Applicants wish to thank the Examiner for the allowance of claims 18 and 19 and for the notice that claims 4-6 and 13-15 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. For the reasons discussed below, the Applicants respectfully request the rejection to the base claims be withdrawn.

Rejection of Claims under 35 U.S.C. § 103

Claims 1-3, 7-12 and 16-17 are rejected under 35 U.S.C. § 103(a) over Liu et al. (U.S. Patent No. 6,144,387) ("Liu") in view of Chang (U.S. Patent No. 5,040,130) ("Chang.").

Liu

Liu is directed to a graphics rendering system using hither plane vertex modification, resulting in less computation expense than a system using hither plan clipping. (Liu, col. 2, lines 61-65, col. 3 line 57.) Hither plane clipping creates a two dimensional representation of a three dimensional scene by determining the projection of three dimensional primitives within the scene on an image plane. "When a primitive is found to have vertices on both sides of a hither plane, any vertices of the primitive on the back side of the hither plane are moved to the hither plane." (Liu, col. 2, line 67 - col. 3, line 3.) Although this process introduces a distortion into the projected images of primitives that cross the hither plane, this distortion is acceptable given the increased rendering speed made possible by eliminating conventional hither plane clipping. (Liu, col. 2, lines 61-65.)

**LIU TEACHES AWAY FROM CHANG AND THEREFORE THERE IS NO
MOTIVATION TO COMBINE LIU WITH CHANG**

The Office Action acknowledges that "Liu et al. does not specifically disclose 'filling only pixels in the portion of the primitive that is inside the screen region.' [filling a pixel after clipping]." Nevertheless, the Office Action asserts that Chang allegedly teaches "clipping but before the area fill stage." (Office Action, page 3.)

Applicants note that court decisions have held that in order for prior art references to be combined by obviousness, at a minimum, there must be a suggestion of desirability for the modification.¹ The CAFC has held that the motivating suggestion must be explicit.² Liu and Chang do not suggest a desirability for modification, explicit or otherwise. Even if Chang does teach "clipping but before the area fill stage," then Liu teaches away from Chang. As shown previously, Liu teaches filling pixels that extend beyond the image plane. Since Liu teaches away from Chang, there is no suggestion or motivation to combine these references. Additionally, at least for the reason that none of the cited references teach or suggest all the elements as arranged in the claims, the combination of any of the cited references cannot produce the Applicants' invention as claimed.

Firstly, Liu teaches away from Chang because Liu teaches filling pixels that extend beyond the display image area of the image plane to form a projection back onto the image plane, whereas Chang teaches clipping vertices beyond the display image. As previously stated, Liu creates a two dimensional representation of a three dimensional scene by projecting a three dimensional primitive behind an image plane onto the image plane. If Liu were modified by

¹ *In re Fritch*, 922 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992).

² *Winner International Royalty Corp. v. Wang*, 48 U.S.P.Q.2d 1139 (D.D.C. 1998), *aff'd*, 98-1553 slip op. (Fed. Cir. 2000).

Chang as suggested in the Office Action, Chang would destroy the projection of the three dimensional primitive onto the image plane. Therefore, since Liu teaches away from Chang, there is no motivation to combine the references, and therefore the Office Action fails to establish a prima facie case of obviousness.³ For example, Liu teaches:

The guard memory region corresponds to a set of pixels of the image plane which extends beyond the display image area of the image plane. Pixels can be written to the portions of the guard memory which are not displayed.

(Liu, col. 3, lines 13-17.)

Although the rendering system can set pixel values throughout the entire guard memory 510, only those within display image area 410 are utilized by the display hardware for the final display image.

(Liu, col. 5, lines 22-24.) In contrast to Liu, according to the Office Action, Chang teaches an opposite approach, namely "clipping but before the area fill stage." Therefore, unlike Chang, Liu teaches filling pixels "which extends beyond the display image area of the image plane." Further, Liu teaches: "Pixels can be written to the portions of the guard memory which are not displayed." Additionally, these rendering systems, according to Liu, teach that "these *pixels* might not all lie within the area of the image plane which represents the display image." (Liu, col. 2, lines 8-17) (emphasis added). Liu requires that "these *pixels* might not all lie within the area of the image plane which represents the display image." Unlike Chang, Liu teaches that pixels are filled for primitives outside of the screen region. As a result, Liu teaches against "clipping but before the area fill stage," and therefore the combination of Liu and Chang is improper. Applicants submit that even if Liu and Chang were combinable, the modification of Liu with Chang would yield something other than Applicants' claimed subject matter. As a

³ A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984), M.P.E.P. 2141.02.

result, since the references teach away from each other, the Office Action fails to establish a prima facie case of obviousness.

Secondly, the proposed modification would change the principle of operation of Liu, because Chang teaches modifying vertices on the back side of the hither plane by moving it to the hither plan, and the modification by Chang would clip the vertices on the back side of the hither plane.⁴ As previously stated, Liu teaches performing graphics rendering through "hither plane clipping" by projecting a three dimensional primitive behind an image plane onto the image plane. (Liu col. 1, line 40 – col. 2, line 6.) As a result, the modification of Liu by Chang would destroy the projection of a primitive onto the image plane and therefore nullify the improvement on the hither plane mechanism taught by Liu.

Thirdly, if one were to combine the teachings of the two references, such a result would be inoperable as the hither plane vertex modification mechanism of Liu would become ineffective.⁵ As previously stated, the modification of Liu by Chang would destroy the projection of the three dimensional primitive behind the image plane onto the image plane and therefore nullify the improvement on the hither plane mechanism taught by Liu. Since Liu teaches clipping the image plane filled with pixels, Liu as best understood appears to teach first filling all of the pixels of the primitive, including the projections of the pixels on the back of the hither plane forming the modified pixels, before clipping the primitives, rather than after clipping the primitives. Accordingly, Chang would render the hither plane vertex modification

⁴ If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959). See M.P.E.P. 2143.01.

⁵ If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 200, 221 U.S.P.Q. 1125 (Fed. Cir. 1984); M.P.E.P. 2143.02.

mechanism inoperable and ineffective because Chang would clip the primitive before the projection is made onto the image plane. Therefore, since there is no motivation to combine the references, the Office Action fails to establish a prima facie case of obviousness, and the 103(a) rejection is improper.

Fourthly, Applicants respectfully submit that the Office Action uses improper hindsight reasoning by suggesting it would have been obvious to modify Liu in view of Chang to achieve Applicants' claimed invention where the Office Action bases such arguments only upon the teaching or suggestion within Applicants' own disclosure.⁶ Applicants submit that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references as described. Liu teaches a completely different approach from Chang because, as stated above, Liu teaches filling *all* of the pixels in a primitive using hither plane vertex modification whereas Chang allegedly recites "filling only pixels in the portion of the primitive that is inside the screen region." As a result, at least for the reasons stated above, the combination of Liu and Chang fails to establish a prima facie case of obviousness. Therefore, the section 103(a) rejection is improper. Accordingly, claims 1-3, 7-12 and 16-17 are believed to be in condition for allowance.

As to claims 2 and 11, Applicants respectfully reassert the relevant remarks made above that Liu teaches against Chang and further note that at least Liu, as cited, does not teach or suggest "filling only pixels in the portion of the primitive that is inside the screen region." Accordingly, since Liu teaches against Chang and Liu does not teach "filling only pixels in the portion of the primitive that is inside the screen region," Liu does not teach "the method steps for

⁶ The Federal Circuit has repeatedly warned against using an applicant's disclosure as a blueprint to reconstruct the claimed invention out isolation of the prior art. *Grain Processing Corp. v. American Maize-Products*, 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988).

each primitive of a plurality of primitives.” Therefore, the section 103(a) rejection is improper, and claims 2 and 11 are in condition for allowance.

Claims 3, 7 and 8

Claims 3, 7 and 8 are rejected under 35 U.S.C. § 103(a) based on Liu in view of Chang. The Office Action acknowledges that Liu fails to teach “using X,Y coordinate system; and determining values of XSTART, YSTART, XEND, YEND for the primitive, providing values of XLEFT, XRIGHT, YTOP, YBOTTOM for the region; and comparing the primitive values to the screen region values to determine if the primitive is totally outside the screen region.”

As discussed above in regard to claim 1, because any combination of Liu and Chang would change the principle of operation of Liu or would produce an ineffective hither plane vertex modification system, one skilled in the art at the time the invention was made would have no incentive or motivation to make the additional changes to such a combination, including those changes reflected in claims 3, 7 and 8. Here, Applicants submit that one of ordinary skill in the art at the time the invention was made would have no motivation to continue to make additional modifications to a system that changed the principle of operation or was inoperable to begin with, particularly if such a modification would do nothing to impact the inoperable status of the earlier combination. Therefore, absent a workable system, one skilled in the art would not be motivated to make a change to such a system when that change would not appear to impact its inoperability. As a result, the Office Action fails to establish a prima facie case of obviousness, and therefore the obviousness rejection under 35 U.S.C. § 103(a) is improper.

Regarding claims 7, 9 and 16, Applicants respectfully submit that these claims are at least allowable as depending from the allowable base claim. Applicants further submit that claims 7, 9 and 16 are also allowable in light of the presence of novel and nonobvious elements that are not otherwise present in claims 1 and 13.

Regarding claims 8 and 15, Applicants respectfully submit that these claims are at least allowable as depending from the allowable base claim. Further, Liu as cited in Fig. 4a-b merely shows triangles and does not teach a start point in this figure. Applicants further submit that claims 8 and 15 are also allowable in light of the presence of novel and nonobvious elements that are not otherwise present in claims 1, 7, 10, 12 and 13.

Regarding claims 10, 11, 12, 16 and 17, Applicants respectfully reassert the relevant remarks made above and further note that again Liu fails to teach or suggest "filling only pixels in the portion of the primitive that is inside the screen region." Applicants further submit among other things that claims 10, 11, 12, 16 and 17 are also allowable in light of the presence of novel and nonobvious elements that are not otherwise present in the base and any intermediate claims.

Applicants respectfully submit that the claims are in condition for allowance and respectfully request that a timely Notice of Allowance be issued in this case. The Examiner is invited to contact the below-listed attorney at 312-609-7970 if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

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